c.) Remarks

The applicants address each of the examiner's comments in turn.

1. Correction of Status Modifiers and Non-elected Species

Applicants respectfully assert that the addition of new claims and the cancellation of previously claims obviates the Examiners objections. Specifically, the new claims do not read on non-elected species.

2. Withdrawal of Previous Rejection

Applicants acknowledge the withdrawal of the rejections from the previous office action not reiterated in the present office action.

3. Objection to Claims 52, 55, 57, and 58

Applicants respectfully assert that the addition of new claims and the cancellation of previously claims obviates the Examiners objections.

4. Rejection of Claims 12, 37, 39, 40, 52, 55, 57, 58, 233, and 234 under 35 USC § 112, second paragraph

A) Applicants amendments obviate the Examiner's rejection in point 4 of the office action. With respect to point 4A of the instant office action, new claim 235 refers to modified DAOCS enzymes that are defined with reference to SEQ. ID NO:1, in particular requiring the DAOCS enzyme to have been modified so that a leucine at a position equivalent to position 158 of SEQ.ID NO:1 or an asparagine at a position which is equivalent to position 304 of SEQ.ID NO:1 is modified. We draw the Examiner's attention to Figure 3 on page 758 of Kovacevic et al (1989) J. Bacteriology 171, 754-60 which shows a comparison of SEQ.ID NO:1 (the S. Clavuligerus DAOCS enzyme) with a DAOCS enzyme from another organism. As can be seen a line up of the sequences shows the amino acids which are conserved

between SEQ.ID NO:1 and the other DAOCS enzyme, including amino acids 158 and 304 of SEQ.ID NO:1.

It must also be noted that given that new claim 235 requires substitution of a leucine and asparagine at defined locations, then enzymes which do not have these amino acids at the defined locations would not be covered by the claims.

Thus given that at the priority date the lining up of two amino acid sequences was a routine matter for the skilled person, it would be clear to the skilled person whether or not a given DAOCS enzyme had a leucine and asparagine at positions equivalent to positions 158 and 304 of the SEQ.ID No.1 (and thus whether or not the modified enzyme fell within claim 235). Therefore new claim 235 is not indefinite.

B) For the reasons discussed in response to the objections in paragraphs 4A, it would be clear to the skilled person which residues of any DAOCS enzyme would correspond to positions 158 and 304 of SEQ.ID.NO:1 and thus claim 235 is clear and not indefinite.

C) The claims referred to by the Examiner have been canceled and therefore this objection is no longer relevant.

5. Rejection of Claims 12, 37, 39, 40, 52, 55, 57, and 58 under 35 USC § 112, first paragraph (enablement)

The Examiner notes that the only structure demonstrated in the specification is of a DAOCS enzyme with sequence SEQ.ID NO:1 and alleges that there is no guidance on how to identify binding sites and or particular residues in other DAOCS enzymes. However, as mentioned above it would be a routine matter for the skilled person to line up sequences of different DAOCS enzymes (especially given that the enzymes have high levels of conservation across regions which are important to enzyme function). Thus having obtained a line up as shown in Figure 3 of Kovacevic et al, identifying the leucine and asparagine

residue equivalent to those at position 158 and 304 of SEQ.ID.NO:1 would be a routine task for the skilled person. As mentioned previously if the original enzyme did not contain an asparagine and leucine at the required positions then the modified enzyme would not be covered by claim 235.

Further, the data filed with the previous response demonstrates that modifications at position 158 enhance enzyme activity. We herewith file copies of Chin et al (2004) Applied and Environmental Microbiology 70, 607-9, Chin et al (2001) Biochemical and Biophysical Research Communications 287, 507-13 and Lee et al (2002) Biochemical and Biophysical Research Communications 292, 66-70 which show that modifications at position 304 enhance enzyme activity.

Thus, subsequent work confirms the importance of amino acids 158 and 304 in the DAOCS enzyme. Given the high level of conservation (i.e. high percentage identity) across the functional regions of different DAOCS enzymes then modification of amino acids at equivalent positions in other DAOCS enzymes will also result in enzymes with enhanced properties. Thus the pending claims are enabled.

6. Rejection of Claims 52, 55, 57, 58, 233, and 234 under 35 USC § 112, first paragraph (enablement)

The claims referred to by the Examiner in this paragraph have been canceled and therefore the objection is no longer relevant.

7. Reply to Examiner's "Response to Arguments"

The Examiner notes in the paragraph headed "Response to Arguments" that with respect to the further publications submitted with our previous response, enablement sufficiency of a specification is determined as of filing date. However in the present case we wish to stress that the specification does enable the making of the enzyme defined in new

claim 235, and that subsequent papers only act as additional evidence that the residues identified in the specification are important in determining enzyme properties.

8. Rejection of Claims under 35 USC § 112, first paragraph (written description, new matter)

The claims referred to by the Examiner in this rejection have been canceled and therefore this objection is no longer relevant.

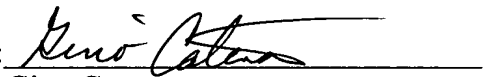
d.) Conclusions

In light of the amendments and arguments made herein, Applicants assert that the pending claims are in condition for allowance and earnestly request same.

Applicants include with this filing, a payment of $1,420.00 which includes payment for 1) a Request for Continued Examination, payment, 2) a 2 month extension of time, and 3) an Information Disclosure Statement. It is believed that these are the only fees due with the filing of this response. However, if Applicants are in error, the Commissioner is hereby authorized to draw any additional fees associated with this filing from Deposit Account No. 06-2375, under Order No. P02005US0/10020482, from which the undersigned is authorized to draw.

Respectfully submitted,

Date: March 21, 2005

By: 

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